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ABSTRACT

The guide gives procedures for helping gifted upper elementary school students in Major Work classes utilize their imagination. Appropriate literary quotes introduce a discussion on creativity, which involves the imaginative recombination of known ideas into something new. Considered are obstacles that work against creativity such as mental laziness, fear of being different, and inadequate motivation. Suggested for teachers to help students use imagination to solve problems are procedures such as establishing an environment of freedom or encouraging self-initiated learning. The creative thinking process is described to consist of defining a problem, collecting data on the problem, and analyzing facts for the fact finding component; producing ideas, incubating ideas, and forcing different relationships on habitual relationships to develop ideas; and evaluating and adopting ideas to seek solutions. A hypothetical problem of a student who dreads classroom elections because she might not be chosen is presented. The first worksheet contains eight facts on the problem, possible sources, and results. The next worksheet lists questions that might define the problem. On the third worksheet the student circles 16 of 27 ideas that might lead to a solution. The fourth worksheet contains a matrix listing previous ideas according to criteria and decision for present or future use. The last worksheet shows nine ways to carry out the idea of making more friends. Sample problems significant to personal relationships, literature, science, social studies, and general situations; a fact finding worksheet; and techniques for producing ideas are provided. (MC)

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IMAGINATION UNLIMITED

A TRIP TOWARD NEW IDEAS IN CREATIVE PROBLEM SOLVING

UPPER ELEMENTARY SUMMER SCHOOL

MAJOR WORK AND ENRICHMENT CLASSES CLEVELAND PUBLIC SCHOOLS

CLEVELAND, OHIO

ECOS 262

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A GUIDE FOR CREATIVE PROBLEM SOLVING

UPPER ELEMENTARY SUMMER SCHOOL

DIVISION OF MAJOR WORK CLASSES
CLEVELAND PUBLIC SCHOOLS
CLEVELAND, OHIO
1969

Cleveland Public Schools

A Guide for Creative Problem Solving---Upper Elementary Summer School

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1969

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Special credit is due the following educators who prepared these guidelines for teaching creative problem solving:

Mrs. Gwendolyn A. Frye - Chairman
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Miss M. Jane McGavisk - Major Work Class Teacher
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Mr. Clarence I. Miller - Enrichment Class Teacher
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Appreciation is also expressed to Mrs. Ruby Delamater who prepared the master copy for this publication.

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FOREWORD

"Imagination is more important than knowledge."[1] Go ahead, challenge these famous words of Albert Einstein, but you would probably be less inclined to refute, "Knowledge can be more powerful when creatively applied."[2]

The importance of imagination cannot be exaggerated. A quick survey of our international, national, and local affairs will reveal a dire need for creative solutions to problems of great magnitude and diversity.

The purpose of this guide is to stimulate thinking on how we can help boys and girls to effectively utilize their imagination, and to offer suggested procedures and guide lines that have been reasonably successful.

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[1] Alex F. Osborn, Applied Imagination (New York: Charles Scribner's Sons, 1963), p. 1.

[2] Ibid., p. 1.

IMAGINATION UNLIMITED

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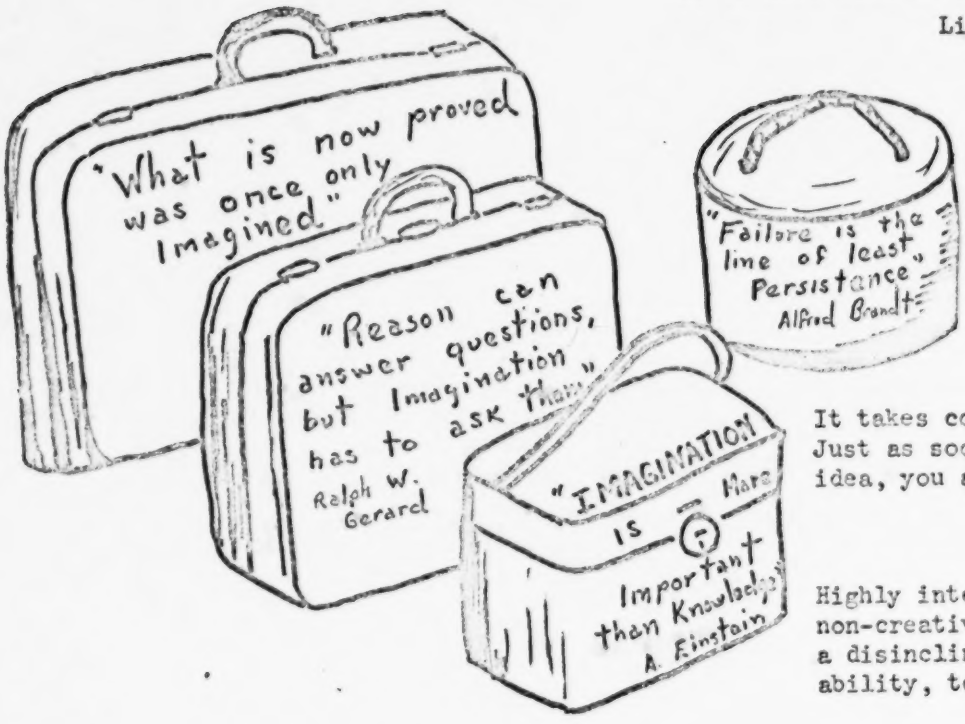
Quotes to know before you go.

The best way to have a good idea is to have lots of ideas.

Linus Pauling


"What is now proved was once only Imagined."
"Reason can answer questions, but Imagination has to ask them."
Ralph W. Gerard
"Failure is the line of least Persistance."
Alfred Brandt
"IMAGINATION is more important than Knowledge"
A. Einstein

It takes courage to be creative, Just as soon as you have a new idea, you are a minority of one.

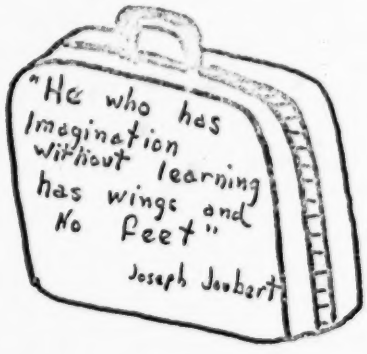
E. Paul Torrance

Highly intelligent, but rather non-creative individuals, have a disinclination rather than inability, to use their imaginations.

Sidney J. Parnes

Inspiration is the impact of a fact on a well-prepared mind.

Louis Pasteur



A fair idea put to use is better than a good idea kept on the polishing wheel.

Alex F. Osborn

The larger the island of knowledge, the longer the shore line of wonder.

Ralph Sockman

Observation, not old age, brings wisdom.

Publilius Syrus

Are you stimulated to continue onward? Do you want to find out more about what you can do about creative problem-solving in your classroom? Then read on!

WHAT DO WE MEAN BY CREATIVITY?

Every person born has the gift of creativity. It is used by the child in his play, in doing or in getting out of doing his daily chores, in building friendships, in meeting the challenges of his day at school.

As the child grows, he finds new ways of applying creativity in sports, in hobbies, in meeting and socializing. In adulthood the housewife uses her creativity to establish and decorate her home, in planning daily meals, in providing daily activities for her children, in developing their patterns of growth.

The housewife, in fact, may have to show more creativity in her work than her husband who is more apt to follow routine or the assembly line. Even so, he may be expected to contribute new techniques or ideas.

Creativity manifests itself in several ways. One is in creative imagination. This is the ability to visualize, to foresee possible outcomes, and to generate new ideas.

Creative imagination is not just imagination alone, but imagination coupled with both intent and effort. Using creative imagination involves looking forward, foreseeing, supplying, completing, planning, inventing, solving, advancing, originating.

Note: Not a single, passive verb present! Creativity involves action! Creative action then, is another phase of creativity.

Creativity is best manifested in solving problems. Creative problem solving involves fact-finding, idea-finding, and solution-finding--each of which will be further discussed in this guide.

What else can be said about creativity?

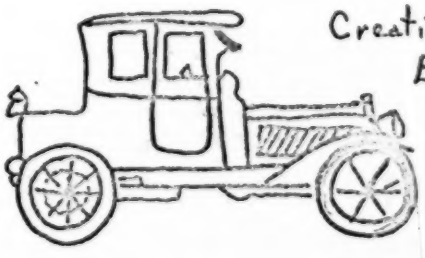
Here are some ideas you might consider:

Creativity is imaginatively recombining ideas already known into something new.

It is that "creative spark" that enlightens, illuminates, and excites.

It is an ideative effort--the more ideas gathered, the greater the quality of the ideas will be.

Creativity is adventurous, bold. It gets away from the main track--breaks out of the mold.



Creative "SPARK"
ENGINuity
Enthusiastic "START"
"Generator" of new ideas
DRIVE
Take off the BRAKES
FUEL with ideas

STOP! ROAD BLOCK AHEAD!

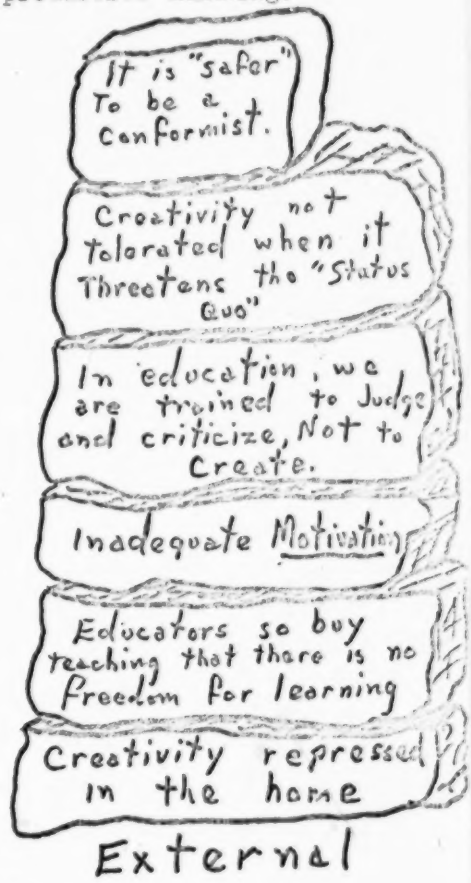
WE'VE RUN INTO A PROBLEM!

THE FACTS:
1. Every one of us has some creative thinking ability.
2. We regularly use only a fraction of our potential.

THE QUESTION: What's keeping us from using more, or all, of the creative thinking potential we now have?

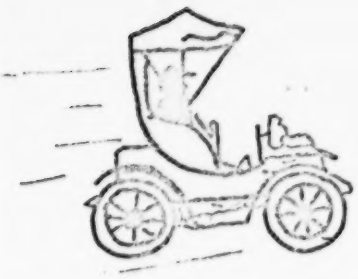
WHAT'S HOLDING US BACK?

THE ANSWER: There are <u>many</u> obstacles that work against the wider application of our latent creative powers. There are both <u>internal</u> and <u>external</u> blocks that inhibit productive thinking.


It is "safer" To be a conformist.
Creativity not tolerated when it Threatens the "Status Quo"
In education, we are trained to Judge and criticize, Not to Create.
Inadequate Motivation
Educators so busy teaching that there is no Freedom for learning
Creativity repressed in the home
External

Steer Clear of These!

An awareness of these inhibiting factors can and should lead to the development of ways to alleviate them, offset them, or eliminate them. Educational programs should be designed and implemented to help the student gain an understanding of past influences on his present behavior, to help him perceive of himself as a creative being, and to provide environmental conditions that encourage creative functioning.



You are in the Driver's Seat

The Teacher's Role

Remember: Every person has this creative imagination and ability to solve problems creatively. It is up to you, as the teacher, to see that it is used.

How can this be done?

1. Obtain and protect a hearing for minority ideas and solutions to problems.
2. Create an environment of freedom, keeping guidance to a minimum to allow the child to express ideas contrary to those commonly held by the majority.
3. Be an adventurous, spirited teacher, willing to listen to wild ideas.
4. Develop a tolerance of the creative personality, at times it can be "hard to take."
5. Provide for active and quiet periods.
6. Create "thorns in the flesh."
7. Create necessities for creative thinking.
8. Teach the child to value his creative thinking.
9. Teach skills for avoiding peer sanctions
    a. Avoid over-assertion.
    b. Avoid bookishness.
    c. As your ideas are repeated, respect others.
10. Encourage and evaluate self-initiated learning.
11. Develop constructive criticism.
12. Make children more sensitive to environmental stimuli.
13. Encourage the habit of working out the full implication of ideas.
14. Encourage acquisition of knowledge in a variety of fields.
15. Make available resources for working out ideas.
16. Beware of forcing a set pattern.

THE CREATIVE THINKING PROCESS

I. Fact-finding

A. Defining the problem

1. Picking out the problem
2. Pointing up the problem
3. Making the target specific
4. Writing the problem

a. Stated clearly
b. Stated broadly
c. Expressed as a question

B. Preparing data relevant to the problem

1. Gathering facts

a. Previously stored (memory)
b. Newly acquired

(1) Related facts
(2) Contributory facts

2. Analyzing facts

a. Why-so and what-if
b. Interrelationships of facts

II. Idea-finding (the most neglected part)

A. Idea-production

1. Characteristics of ideation

a. Numerous approaches
b. Piles of tentative ideas
c. Quantity breeds quality
d. Deferred judgment

Deferred Judgment

Alfred N. Whitehead observed that there is a certain amount of foolishness in any new idea when it is first produced. Many silly ideas have later become useful in solving problems. In the early stage of generating ideas, we should give imagination priority over judgment. This temporary withholding of evaluation

is called the principle of deferred judgment.

So, don't judge too soon. When novel ideas are permitted to come forth, they may often be refined and developed into worth-while means of solving problems.

e. Incubation process

Incubation Process

The incubation process has been given several descriptions:

1. "Do-nothing" period
2. Sleeping on a problem
3. Unconscious effort
4. Letting up
5. Purposive relaxation

This important phase of ideation frequently results in bright ideas. It has been suggested that this period of little conscious effort may be successful because of the previous periods of much conscious effort. Those of us who have toiled writing term papers, can remember retiring and awakening with a new idea that was formed while we were not consciously involved with the term paper.

f. Habitual relationships

Habitual Relationships

We are creatures of habit. How else could we crowd so much into a day? These automatic responses enable us to swiftly face many everyday situations. Yet, when you think about it, we frequently let our habits keep us from handling new problems as effectively as we might. We permit the "habit" approach to interfere with creativity.

It is understandable that we tend to associate ideas or objects to each other in fixed patterns because of habit. These associations could be called habitual relationships. Some examples of "habit associations" are ham and eggs, bread and butter, and sister and brother.

g. Forced relationships

Forced Relationships

Deliberate or forced relationships must be "turned on" while habitual relationships are suspended or shelved temporarily. We make an honest effort to step out of the "rut of habit" to make different associations between ideas and objects. These different associations are called "forced" relationships.

Let us consider the habitual association of bread and butter. We will temporarily shelve butter and think of other spreads. It is possible to think of ideas that might lead to another "Manners Big Boy."

2. The working mood

   a. Flex imagination
   b. Forget everything else
   c. Uninhibit yourself
   d. Keep an open mind
   e. Be alert for hunches
   f. Try anything

3. Techniques of idea-production

   a. Association of ideas

      (1) The role of a catalyst
      (2) The mind - a kaleidoscope
      (3) The accidental factor
      (4) The laws of association

         (a) Contiguity (nearness)
         (b) Similarity
         (c) Contrast

   b. Brainstorming for ideas

      (1) A conference - group technique
      (2) A group list of ideas
      (3) Free-wheeling of ideas
      (4) Versatility of application

   c. Attribute - listing

      (1) Everything starts from something else
      (2) Creation equals observation plus adaptation

B. Idea - development

   1. Selecting from resultant ideas
   2. Adding other ideas
   3. Reprocessing ideas

a. Modification
b. Combination

III. Solution - finding

A. Evaluation of ideas

1. Verification of tentative solutions
2. Confirmation of worth

B. Adoption of ideas

1. Adaptation
2. Modification
3. Substitution
4. Implementation

LET'S SEE HOW THIS CREATIVE PROBLEM-SOLVING PROCESS CAN BE EFFECTIVELY USED IN THE CLASSROOM--

Since creative problem-solving is a skill, it can be developed and improved with practice. The structured worksheet approach is a valuable aid in supplying such practice. Prior to individual effort, the total process is presented to the group, and each step is thoroughly discussed. Then several problems are worked on a group basis. Five separate worksheets, one for each of the five steps, are provided. A child's sample worksheets illustrating the use of the creative problem-solving process have been reproduced.

It should be noted that a rigid structure cannot be supplied for so dynamic a process as creative problem-solving. While the five phases or steps provide a helpful guide, they are not an inflexible formula for meeting all challenges. These worksheets should be adapted to suit the special needs of each particular problem depending upon the nature of the problem.

What should I do?

I am in a fifth grade Major Work class, and although we have had officers in our classes since the third grade, I have never even been nominated. I just dread the times when we elect new class officers because I know I'll never be chosen, and this is something I would really like.

Worksheet No. 1 *FINDING THE FACTS*

What other facts would you like to know about the problem? (List only fact-finding questions).	Where might the answers to the questions be obtained? List all possible sources.	When you are able, investigate your sources for further information. What did you learn?
1. *Are there other children in the room who have the same problem?*	*Classmates* *Teachers*	*Yes, a minority group of about 8.*
2. *Are the same children elected time after time?*	*Classmates* *Teachers (present and previous)*	*Some children do seem to get elected, but also some new children.*
3. *What are these children (the ones elected) like?*	*Personal observation* *Teacher* *Classmates*	*Friendly, help others, do work on time, don't goof around*
4. *What qualities should a person have to be an officer?*	*Teachers* *Parents* *Read books*	*Sense of responsibility, mature, friendly, intelligent, willing to work, desire to do well*
5. *Do I have these qualities?*	*Myself* *Teacher* *Parents*	*Some (intelligence, desire to do well) but not others*
6. *Do I have many close friends?*	*Myself* *Classmates* *Parents*	*Only 2*
7. *What do adults do to get elected?*	*Teachers* *Parents* *Other adults* *Books*	*Campaign, work hard*
8. *What children do I vote for?*	*Myself*	*Friendly people who are nice to me*

Worksheet No. 2 *DEFINING THE PROBLEM*

List all the questions or challenges suggested by the problem. (Use creative type questions such as: "How might I .....?" "What ways might I .....?" "What might I do to .....?").

1. *What might I do to get elected?*
2. *How might I become more popular?*
3. *How might I become a class leader?*
4. *What ways might I use to keep the same people from always getting chosen?*
5. *How might I get someone to nominate me?*
6. *What might I do to get the qualities needed to be elected?*
7. *How might I work with other children who have never been officers?*
8. *How might I be happy without ever being elected to an office?*
9. *How might I become a better student?*
10. *How might I make more friends?*
11. *How might I change?*

Now circle the most promising statement for creative attack. Perhaps it is the one that would give you the greatest leeway, the largest number of approaches. It may be one of the narrower statements that is really the crux of the situation. Choose the one which is most significant to you.

Worksheet No. 3 *FINDING THE IDEAS*

The principle of deferred judgment is put into practice at this stage.

Write the problem statement here: (This is the one you have selected from the previous worksheet). *What might I do to get the qualities needed to be elected?*

Ideas: List as many tentative leads to the solution as you can. Do not judge or evaluate your ideas--just list them all--wild, zany, or sensible.

1. *Be a ready helper.*
2. *Get my work done.*
3. *Be funny.*
4. *Always do my best.*
5. *Be quiet.*
6. *Look pretty.*
7. *Be helpful to the teacher.*
8. *Be willing to make friends.*
9. *Don't disturb people.*
10. *Listen politely even if I already know it.*
11. *Bring an apple for the teacher.*
12. *Don't make fun of people.*
13. *Send get-well cards when people are sick.*
14. *Don't tell on people.*
15. *Bring in extra, interesting things to share.*
16. *Don't cheat.*
17. *Stay alert.*
18. *Don't fidget.*

Worksheet No. 3 (Continued)

19. *Be generous with my things.*

(20.) *Ignore people that bother me.*

21. *Bring treats.*

(22.) *Be especially nice to friends I already have.*

23. *Don't say stupid things that anger people.*

(24.) *Don't complain or disagree so much.*

(25.) *Get rid of irritating habits.*

(26.) *Don't show off.*

(27.) *Don't stick my nose in other people's business.*

Now go back and circle the ideas that seem to offer the best potential for solving the problem.

Worksheet No. 4 *FINDING THE SOLUTION*

1. List the criteria. What are the "yardsticks" by which you can mentally test the effectiveness of each of your ideas? Try to anticipate all effects, repercussions, and consequences.

2. Evaluate only your circled ideas from the previous worksheet. For each of these ideas, indicate a rating in each block. (G-good, F-fair, P-poor, DP-doesn't pertain).

3. Make a decision regarding each of the circled ideas by checking or commenting in one of the boxes under "Decision."

Number of Ideas from Previous Worksheet	CRITERIA*					INDICATE DECISION BELOW			
	Effect on objective	Effect on me	Effect on class mates	Effect on teacher	Effect on family	Use now	Hold	Reject	Notes
1	G	G	G	G	DP	X			
2	G	F	F	G	G	X			
4	G	G	F	G	G	X			Combine 1,
8	G	G	G	G	G	X			8, 12 and 14
9	F	F	G	G	DP	X			into one
10	F	F	G	G	DP	X			idea. Make
12	F	F	G	G	DP	X			more friends.
13	F	F	G	F	DP		X		
14	F	F	G	G	DP	X			
15	G	G	G	F	G		X		
16	F	G	F	G	G	X			
20	P	F	F	G	DP		X		
22	F	F	F	F	DP		X		
24	F	F	G	G	DP	X			
25	F	F	G	G	G		X		
26	F	F	F	G	DP	X			
27	F	F	G	G	DP	X			

*Criteria for each problem will be determined by the nature of the problem.

Worksheet No. 5 *IMPLEMENTING THE FINAL SOLUTION*

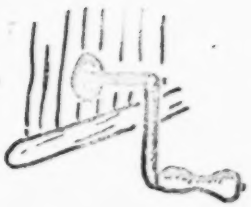
First idea (or combination of ideas) to be developed. (Select from the previous worksheet).

Write the idea here: *Make more friends.*

Do not fill in Columns B & C until you have finished Column A.

Column A Ways of carrying out the above idea (use deferred judgment)	Column B Who, When, and/or Where?	Column C How and/or Why?
(1.) Be helpful and co-operative.	To all classmates--pick up things, hold door, let them go first	To practice better manners --I will be better liked
(2.) Be a good listener.	Comment on reports; ask questions.	Show I am interested in other people.
3. Give a party.		
4. Don't be pushy.		
(5.) Don't say things to hurt other people.	Compliment instead of insult; think before I speak.	People will realize I am kind.
(6.) Compliment others when they look nice or do good things.	Notice other people's clothes and say so when I like them.	
(7.) Be happy - smile.	Always smile!	Avoid frowning and pouting (people won't like me).
(8.) Take my turn.	Always! Don't push or shove.	
(9.) Don't monopolize discussion.	During discussions, let other people have a turn talking.	My ideas might not be the best.
10. Don't tell on others.		
11. Give out treats.		
12. Laugh at jokes.		
(13.) Develop like interests.	Find out what other classmates like and then read and learn about them.	The more interests I have, the more I will have in common so I can make more friends.
(14.) Look pretty.	Take care of my clothes--always clean and neat!	

Now go back and circle the best ones in Column A. Then for each circled one, list further thoughts in Columns B and C regarding the who, when, where, how, and why. You will need a separate sheet for each idea you decided to use on the previous worksheet.



"Crank up" and get started —

HERE ARE SOME SAMPLE PROBLEMS YOU MAY WANT TO USE

Personal Relationships

1. Your best friend has invited you to a party. He has also invited someone who you do not like and with whom you do not wish to associate. You want to go to the party, though. What will you do?

2. You have moved and as a result you will be transferred to a school where you know you will be the only one of your race. How will you meet this situation?

3. One of your close personal friends has lately developed some bad habits that will get him into trouble if discovered. You know your parents would stop you from associating with this person if they knew about these habits. Can you solve this problem?

4. Every day you hear your friends, neighbors, even relatives talking about people of other races or religions as though they were evil. You know that much of what they say is not true, but you don't want to be "dropped" from your group. Is it possible for you to solve this problem and still be fair to all?

5. Someone has taken something that belongs to you. You know he has but you have no way to prove it to anyone else. What can you do about it?

Literature

1. Your parents have special permission from the school to take you on a long trip during the school year. In order to go you must report on all the new things you have seen and learned on your trip. How can you keep a careful record and make a report when you will be too excited to even think of school?

2. Examine some winners of the Newberry Award and compare them with books that have not won such an award. Why do you think the Newberry winners received the award? What is different about them?

3. You are having difficulty with some of the words in a book you are reading. Can you devise a game that can be used to teach yourself and others the troublesome words?

4. Reading poetry can sometimes be difficult. Perhaps the reading of poems can be coupled with the playing of rhythmic instruments. What will you need to know before this can be done?

Literature (Continued)

5. The book you are reading is exciting to you. You would like to rewrite it as a play and have your group perform it for others. This involves a great deal of planning. What are some of the problems you will have?

Science

1. In your lifetime there have been many new discoveries and inventions. Your parents or grandparents may not understand some of them as well as you do. How can you keep from seeming to be overbearing when discussing these things at home?

2. If you had a large rock to be removed from your yard and only one other person to help you, what methods might you employ to remove it?

3. You are moving to a second story apartment. When you arrive you find that the stove will not go through the door. How would you go about solving this problem?

4. You would like to discover the geological history of the area in which you live. No books have been written to tell you about that specific area. What means might you use to find out this information?

Social Studies

1. Maps and globes change daily because nations change names and boundaries. What might be done to keep our expensive maps and globes up-to-date and usable?

2. You would like to write a history of the important events of the world that have happened in your lifetime. How will you go about this?

3. While studying a foreign country you decided you would like to learn its language. Find out how you may do this and do it.

4. Would it be possible for you to take a trip around the world without using any means of commercial transportation?

5. Newspapers record history as it is happening. With your classmates take a major problem from the daily paper and decide how you might go about solving that problem, (e.g. Lee-Seville housing situation).

6. Your class has been studying Latin America and another class has been studying the growth of the United States. How might you work together to present a program to the school?

General

1. List your pet peeves. Determine which of these bothers you most. How can this problem be solved? Can the others be solved in like manner?

2. You are giving a surprise party for a friend. You want it to be a different kind of party than you've ever given before. Remember, a party takes a great deal of planning!

3. You have planned your party and are ready for it. Refreshments are out, decorations up, gifts or prizes bought, and no one shows up! What can you do?

4. You have traveled all the way from Cleveland to California to visit a relative. When you get there you discover all your luggage is missing. What will you do about it?

5. You wanted a baby brother and got a baby sister instead.

WORKSHEET

Fact-finding

List problems, needs, opportunities for creative problem-solving. To help you think of problems, consider the following:[1]

1. What would you like to do, have, accomplish?
2. What do you wish would happen?
3. What would you like to do better?
4. What do you wish you had more time for?, more money for?, etc.?
5. What more would you like to get out of life?
6. What are your unfilled goals?
7. What angered you recently?
8. What makes you tense, anxious?
9. What misunderstandings do you have?
10. What have you complained about?
11. With whom would you like to get along better?
12. What changes for the worse do you sense in attitudes of others?
13. What would you like to get others to do?
14. What changes will you have to introduce?
15. What takes too long?
16. What is wasted?
17. What is too complicated?
18. What "bottlenecks" exist?
19. In what ways are you inefficient?
20. What wears you out?
21. What would you like to organize better?

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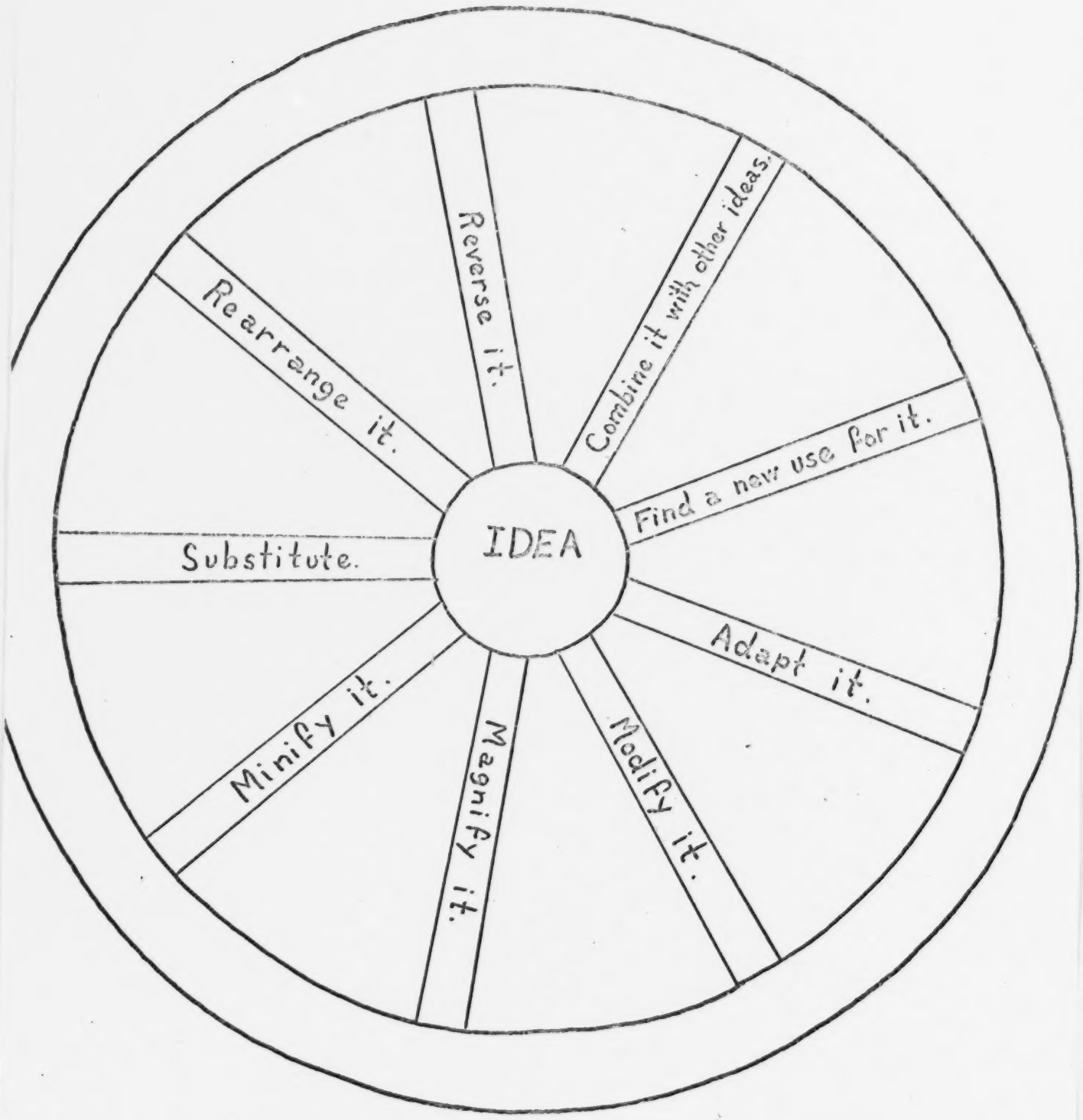
[1] Sidney J. Parnes, Creative Behavior Workbook (New York: Charles Scribner's Sons, 1967), p. 105.

JUST KEEP ROLLING ALONG!



DO YOU NEED A PUSH IN PRODUCING IDEAS?

Try these techniques:

Use of idea-spurring questions (help stretch the ability to produce creative ideas):[1]

1. To what new uses can the idea be put?

2. How can I adapt the idea to another use? What else is like this? What other ideas does it suggest?

3. How can I modify the idea? For instance, could I change the meaning, color, motion, sound, odor, taste, form, shape--give it a new twist?

4. How could I magnify the idea? Could I add something to it--more time, greater frequency, extra value--make it stronger, higher, longer, thicker, larger, heavier? Could I duplicate, multiply, exaggerate?

5. Could I minify the idea: subtract something, make smaller, condense, put in miniature, lower, shorten, narrow, lighten, omit, slow, streamline, understate?

6. Could I substitute: who else, what else, other ingredients, other material, other process, other place, other power, other plane, other approach, other tone of voice, other time?

7. Could I rearrange it: change components, pattern, layout, sequence, schedule, change pace?

8. Could I reverse it: transpose, positive and negative, opposites, turn it around, turn it backward, upside down, inside out, reverse roles, turn tables, transfer cause and effect?

9. Could I combine it with something else: a blend, an alloy, an assortment, an ensemble, combine units, purposes, appeals, ideas?

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[1]James A. Smith, Setting Conditions for Creative Teaching in the Elementary School (Boston: Allyn and Bacon, Inc., 1966), p. 165.

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